

Bird Monitoring as an Aid to Riparian Restoration

Findings from the Trinity River in northwestern California



Photo © Ian Ausprey

Program Area

The Trinity River Restoration Program works in a 40-mile program area, defined as the mainstem Trinity River from the Lewiston Dam to its confluence with the North Fork Trinity River.

Trinity River Restoration Program

The Trinity River Restoration Program began in 2000 with the goal of restoring the Trinity River's salmon and steelhead fisheries, which were severely degraded during the last half-century as a result of dams, water diversions under the Central Valley Project, and land-use practices such as gold mining. The restoration program, as outlined in the U.S. Department of the Interior's Record of Decision (2000), was founded to restore the fisheries by restoring features of a healthy alluvial river system, such as spring floods, river channel complexity, and gravel spawning habitat.

An additional program goal was to maintain or enhance riparian habitat. While some riparian habitat was lost as an expected consequence of channel rehabilitation activities, new riparian habitat has started to form due to strategic plantings and natural regeneration. This restored riparian habitat is being adaptively managed to increase plant species diversity and structural complexity and provide benefits for wildlife. Bird monitoring evaluates and informs riparian restoration by demonstrating wildlife benefits and identifying habitat features still needed for a functional riparian ecosystem.

Birds as Ecological Indicators

In order to understand the health of the environment it is necessary to use indicators because ecological systems are too complex to measure fully. While no single group of organisms can exactly represent the health of another, birds are among the best indicators to use (Hutto 1998, Altman 2000, Carignan and Villard 2002). Birds are **diverse** and they represent a large number of specific ecological conditions. Importantly, birds are **well-studied** so their habitat associations are generally well-known. Birds are also **cost-effective** to survey; a simple standardized methodology can detect over 200 species, providing information about associated ecological conditions. Additionally, birds tend to be **high on the food chain** so their persistence on the landscape depends on the presence of multiple other species. Finally, birds are effective indicators because they **respond to habitat changes at various scales**, due to their links to taxa that respond to small- and large-scale disturbance (e.g., insects and some mammals, respectively). When these factors are considered together, it is apparent that bird monitoring programs provide useful information about the integrity and functioning of the environment as a whole.

Bird Monitoring Contributions Now and in the Future

Bird monitoring on the Trinity River has delivered baseline ecological data to inform restoration activities and assess its impacts and successes. Bird population data collected prior to restoration will help determine whether the program goal to maintain or enhance riparian habitat is achieved. Bird-habitat associations identify important habitat features that will guide management to ensure the recovery of focal species populations post-restoration. Bird monitoring has also demonstrated that ecological value is returning at the Hocker Flat restoration site after only a few years.

Ongoing monitoring includes methods that will provide more detailed information about the abundance of birds as well as their habitat choices and reproductive success (Stephens and Ausprey 2012). In 2012, we began implementing two additional intensive survey methodologies—spot mapping and nest monitoring—to determine whether focal species are establishing territories in restored habitat and if so, what riparian components are preferred. These new studies will also determine the reproductive success of these individuals to ensure abundance is not a misleading indicator of population health. These monitoring efforts will allow us to more precisely link bird health to restoration activities. Our findings will continue to inform the adaptive management of riparian restoration on the Trinity River, with expected benefits for wildlife and humans.

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Restoration Program**



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